

Appl. Serial No. 10/742,899
Amendment dated April 11, 2005
Reply to Office Action of October 15, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (currently amended). A dispenser for paste-like products comprising a substantially cylindrical container (1) which contains the paste-like product and which is equipped at the bottom side with a follower piston (22), which is slidably displaceable on an inner wall of the container under pressure of the external atmosphere, and at its upper end carries a headpiece (3) which is slidably displaceable relative to the container (1) and comprises a discharge channel (32) for the product, which is connectable in communicating fashion to the container (1), and acts on a manually operable delivery means with a delivery chamber (100) of a variable volume for the product, the delivery means comprising a delivery element (5) which is longitudinally displaceable relative to the container (1) and the headpiece (3) and includes a delivery piston (51) which is slidably displaceable in the delivery chamber (100) and is connected to a delivery shaft (50) which circumferentially surrounds a delivery channel (50a) which comprises a delivery channel inlet opening (53) communicating with the delivery chamber (100) and a delivery channel outlet opening (58),

characterized in

that the discharge channel (32) is configured to extend laterally relative to the longitudinal direction of the delivery channel (50a), that the delivery channel outlet opening (58) is arranged on the circumferential surface of the delivery shaft (50) and, starting from an initial position in which the delivery channel outlet opening (58) is closed by a bushing (31) formed on the headpiece (3), can be brought by a displacement movement of the delivery element (5) relative to the headpiece (3) into a position in which the delivery channel outlet opening (58) is exposed relative to the discharge channel (32), for dispensing a paste-like product.

comprising:

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(a) a generally cylindrical hollow container (1) having a vertical longitudinal axis (X) and upper and lower ends, said container including intermediate its ends a transverse wall (10) that defines in said container a lower chamber (10a) for receiving the paste-like product, and an upper delivery chamber (100) having a cylindrical wall defined on a sleeve portion (13) of said container, said lower chamber containing a follower piston (22) that is vertically displaceable by the atmospheric pressure acting thereon, said transverse wall containing a discharge opening (11) containing valve means (20) that afford the passage of a variable volume of the paste-like product from said lower chamber to said delivery chamber when the pressure of said lower chamber exceeds that of said upper chamber;

(b) a generally cylindrical main headpiece (3) arranged above said transverse wall for vertical displacement relative to said container, said headpiece having upper and lower ends, said lower end containing an internal chamber terminating at its upper end in a top wall (35), said internal chamber having an inner cylindrical side wall that defines bushing means (31), said headpiece containing at its upper end a laterally extending product discharge channel (32) in communication with said internal chamber;

(c) a generally cylindrical vertically arranged delivery piston (5) arranged for vertical sliding movement relative to said container, said piston having an upper end (50) that extends within said headpiece internal chamber and terminates in an upper end wall (54), said piston having a lower end (52) that is in sliding engagement with said delivery chamber cylindrical wall, said piston containing a vertical longitudinal delivery channel (50a) having at its lower end an inlet opening (53) in communication with said delivery chamber, said delivery piston upper end containing at least one radial outlet opening (58) in communication with said longitudinal delivery channel; and

(d) spring means (7) biasing said headpiece upwardly toward a first position relative to said container;

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(e) said delivery piston having a first position relative to said container such that when said main headpiece is in said first position, the upper end of said delivery piston is spaced by a given distance (a) from said main headpiece upper wall, and said delivery piston outlet opening is closed by an upper first surface portion (31b) of said bushing means;

(f) said main headpiece being longitudinally displaceable downwardly relative to said container and said piston toward a second position in which said headpiece top wall engages said piston upper wall, and said bushing means first surface portion is displaced to an open position relative to said delivery piston outlet opening;

(g) said headpiece being downwardly displaceable from said second position toward a third position relative to said container, thereby causing said piston to be displaced by said headpiece to a second position relative to said container, whereby the pasty-like product is pumped from said delivery chamber to said product discharge channel via said piston longitudinal discharge channel and said piston outlet opening.

Claim 2. (currently amended) The dispenser according to claim 1, characterized in that the bushing is designed as a guide bushing (31) headpiece bushing means includes a lower second bushing surface portion (31a) which guides the delivery means piston in a longitudinally displaceable manner and which comprises at least one guide surface cooperating with the circumferential surface of the delivery shaft (50) piston.

Claim 3 (currently amended) The dispenser according to claim 1, characterized in that the headpiece (3) and the delivery means piston have provided thereon entraining means (34, 57) by which the delivery means piston is entrained after manual operation during resetting of the headpiece (3) into the initial first position.

Claim 4 (currently amended) The dispenser according to claim 3, characterized in that the bushing (31) has formed thereon said entraining means includes an entraining shoulder (67)

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which cooperates with an entraining rim (34) formed on the delivery shaft (50) piston.

Claim 5 (currently amended) The dispenser according to claim 4, characterized in that the entraining shoulder (34) is provided at the end side on the bushing means (31) at the transition to the discharge channel (32), and the entraining rim (57) is provided in the end portion of the delivery shaft (50) at the front side.

Claim 6 (currently amended) The dispenser according to claim 2 1, characterized in that the delivery piston (51) radially projects beyond the delivery shaft (50) for forming radially outwardly to define an annular contact surface (51a), and that the guide bushing means (31) has a pressure end surface (33) at the front side that is arranged in the initial position at an said given axial distance relative to the contact surface (51a) and can be placed by axial displacement of the headpiece (3) towards the container (1) on the contact surface (51a).

Claim 7 (currently amended) The dispenser according to claim 1, characterized in that the inner wall of the delivery chamber (100) is formed by an inner sleeve portion (13) which at the front side of the container (1) at the headpiece side is provided on the container (1) at the side facing adjacent the headpiece (3).

Claim 8 (currently amended) The dispenser according to claim 7, characterized by a mating headpiece (4) which comprises a holding cylinder (41) put over the inner sleeve (13) in the manner of a cup, and a guide cylinder (42) which is arranged concentric to the holding cylinder (41) and guides A dispenser for dispensing a paste-like product, comprising:

(a) a generally cylindrical hollow container (1) having a vertical longitudinal axis (X) and upper and lower ends, said container including intermediate its ends a transverse wall (10) that defines in said container a lower chamber (10a) for receiving the paste-like product, and an upper delivery chamber (100) having a cylindrical wall defined on a sleeve portion (13) of said container, said lower chamber containing a follower piston (22) that is vertically displaceable

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by the atmospheric pressure acting thereon, said transverse wall containing a discharge opening (11) containing valve means (20) that afford the passage of a variable volume of the paste-like product from said lower chamber to said delivery chamber when the pressure of said lower chamber exceeds that of said upper chamber;

(b) a generally cylindrical main headpiece (3) arranged above said transverse wall for vertical displacement relative to said container, said headpiece having upper and lower ends, said lower end containing an internal chamber terminating at its upper end in a top wall (35), said internal chamber having an inner cylindrical side wall that defines bushing means (31), said headpiece containing at its upper end a laterally extending product discharge channel (32) in communication with said internal chamber;

(c) a generally cylindrical vertically arranged delivery piston (5) arranged for vertical sliding movement relative to said container, said piston having an upper end (50) that extends within said headpiece internal chamber and terminates in an upper end wall (54), said piston having a lower end (52) that is in sliding engagement with said delivery chamber cylindrical wall, said piston containing a vertical longitudinal delivery channel (50a) having at its lower end an inlet opening (53) in communication with said with said delivery chamber, said delivery piston upper end containing at least one radial outlet opening (58) in communication with said longitudinal delivery channel;

(d) spring means (7) biasing said headpiece upwardly toward a first position relative to said container;

(e) said delivery piston having a first position relative to said container such that when said main headpiece is in said first position, the upper end of said delivery piston is spaced by a given distance (a) from said main headpiece upper wall, and said delivery piston outlet opening is closed by an upper first surface portion (31b) of said bushing means;

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(f) said main headpiece being longitudinally displaceable downwardly relative to said container and said piston toward a second position in which said headpiece top wall engages said piston upper wall, and said bushing means first surface portion is displaced to an open position relative to said delivery piston outlet opening;

(g) said headpiece being downwardly displaceable from said second position toward a third position relative to said container, thereby causing said piston to be displaced by said headpiece to a second position relative to said container, whereby the pasty-like product is pumped from said delivery chamber to said product discharge channel via said piston longitudinal discharge channel and said piston outlet opening, and

(h) a generally cylindrical mating headpiece (4) connected with said container for guiding said main headpiece, said mating member having an outer holding cylindrical portion (41) arranged concentrically about said container inner sleeve portion, and an inner tubular guide portion (42) arranged concentrically within said sleeve portion for guiding the sliding displacement of the headpiece (3).

Claim 9 (original) The dispenser according to claim 8, characterized in that the end of the guide cylinder (42) at the delivery chamber side comprises a delivery piston stop (42a) for the delivery piston (51).

Claim 10 (original) The dispenser according to claim 8, characterized in that the holding cylinder (41) is provided with an annular shoulder (44) at the bottom side which forms a contact surface for a coil spring holding the headpiece in the initial position under bias and is put on the front side of the container (1).

Claim 11 (original) The dispenser according to claim 8, characterized in that the mating headpiece (4) comprises at least one stop (46a) for defining the axial displacement movement of the headpiece (3) and is formed together with the headpiece (3) as a prefabricated dispenser

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member (60) is integral with a coating (61) formed at least at the front side on the outside of the headpiece (3).

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component and is fastened at the front side to the container (1).

Claim 12 (original) The dispenser according to claim 11, characterized in that the dispenser component is locked with the container (1) via locking means (47; 17) formed on the mating headpiece (4) and the front side of the container (1).

Claim 13 (original) The dispenser according to claim 1, characterized in that the headpiece (3) is longitudinally displaceable such that the headpiece (10) can be brought by manual operation from the initial position first by a first axial distance (a) for contact with the delivery piston with simultaneous exposure of the delivery channel outlet opening (58) in the discharge channel (32) into a central position (M) and the headpiece (3) can then be brought with a progressive axial displacement with entrainment of the delivery piston (51) from the central position (M) into a discharge end position (V) in which the delivery chamber (100) has reached its minimum volume by displacement of the delivery piston (51).

Claim 14 (original) The dispenser according to claim 1, characterized by a closure member (60) which is fixed to the headpiece and by which a product discharge opening (39) of the discharge channel (32) can be closed.

Claim 15 (original) The dispenser according to claim 14, characterized in that the product discharge opening (39) is formed as a ring around a closure mandrel (32a) arranged in the discharge channel, and that the closure member (60) has an annularly formed sealing lip which can sealingly be placed on the closure mandrel.

Claim 16 (original) The dispenser according to claim 14, characterized in that the closure member (60) is made from a flexible plastic material, preferably from a thermoplastic elastomer.

Claim 17 (original) The dispenser according to claim 14, characterized in that the closure